

Brookhaven National Laboratory National Synchrotron Light Source		Number: LS-PPS-0021	Revision: A
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Subject: <u>X5A Laser Hutch</u> Radiological Interlock Test			
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*Approval signatures on file with master copy.

[Revision/Periodic Review Log](#)

BEAMLINE:	Test Result: <input type="checkbox"/> Passed <input type="checkbox"/> Failed	
Test Reason:	Test Type: <input type="checkbox"/> Full <input type="checkbox"/> Partial	
Test Date:	Start Time:	Finish Time:
Tester 1:	Assistant 1:	
Tester 2:	Assistant 2:	

PREPARATION:

Inform control room operator that test will be done.

Turn off 'Red Tag' switch on x-ray ring interlock, and apply LOTO to X-Ray Security system.

Verify that vacuum valves and water interlocks are satisfied on the beam line or connect user interlock test jumper.

1. Search the hutch

The overhead lights go out

The red interior light comes on

The audible alarm sounds for 13 to 15 seconds minimum

The hutch interlock sign turns on

2. Open hutch door

The hutch interlock sign goes out

3. Press CS-1, close hutch door and wait.

Hutch interior lights come on in not more than 50 seconds

Press CS-E.

Interlock does not activate

4. Press interior search buttons in order, close door, press CS-E, note that alarm comes on, open and close door, press CS-E again. (This must all be done in less than the timeout interval noted in step 3)

Interlock does not activate

5. Search hutch, one person remains inside. Put hutch key in SRU and turn.

The Safety Shutter "enable" light does not come on until the end of the warning interval

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|----|---|-------------------|-------------------|-------------------|
| 6. | The person inside presses an Emergency Stop (ES) Button. | <u>ES1</u> | <u>ES2</u> | <u>ES3</u> |
| | The shutter "enable" light goes out | _____ | _____ | _____ |
| | The ES indicator comes on | _____ | _____ | _____ |
| | The ES latch cannot be reset unless the SOR key is turned | _____ | _____ | _____ |

Repeat step 6 for remaining Emergency Stop buttons.

7. Place latch device on door lock so key can be removed. Place switch holders on door switches. Search hutch, put door key in SRU and turn, open safety shutter. The "Beam On" sign turns ON _____

Remove holder from switch 2.

RIB latch light comes on

Replace holder on switch 2.

RIB cannot be reset unless SOR key is turned.

Remove holder on switch 1.

Safety shutter closes

RIA latch light comes on

Hutch interlock drops out

"Beam On" sign goes out

RIA can't be reset w/o SOR

Replace holder on switch 1.

8. Search hutch, leave shutter closed.

Laser Hutch Kirk key (KKH) cannot be removed from SRU unless button is pushed _____

Open safety shutter.

KKH cannot be removed even if button is pushed _____

9. Close shutter. Turn KKH and note where solenoid unit stops rotation. Push the button and turn key just beyond this point, but not far enough to actuate "key removed" switch. Release the button and leave key in this position. Open shutter, remove KKH, and replace.

RIA latch light comes on _____

RIB latch light comes on _____

The safety shutter closes _____

Door:	
1	2

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10. With hutch interlocked, leave shutter closed.
 - Beam line transfer key can be removed only if button on SRU is pushed _____
 - Open safety shutter.
 - Beam line transfer key can't be removed even if button is pushed _____
 - Close safety shutter. "Cheat" SRU as described in step 9. Open safety shutter, remove the key and replace.
 - RIA latch light comes on _____
 - RIB latch light comes on _____
 - The safety shutter closes _____
 - SPA comes on _____
 - SPA can't be reset w/o SOR _____
 - Reset RIA and RIB

11. Open safety shutter. Press an emergency stop button.
 - RIA latch light comes on _____
 - RIB latch light comes on _____
 - Hutch interlock drops out _____
 - ES indicator comes on _____
 - Safety Shutter Closes _____

12. Open the safety shutter. Remove the Control Room Shutter Enable Key for this beam line, then replace the key.
 - The safety shutter closes _____
 - RIA latch light comes on _____
 - The "Control Room Shutter Enable" light goes out _____
 - The SPA latch comes on (after the key is back on) _____
 - The safety shutter cannot be opened _____
 - Reset RIA and SPA

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13. One person goes to the x-ray equipment area and resets the indicators for RIAX and RIBX at SR100.

Open the safety shutter and photon shutter (if equipped).

Remove switch holder from door switch number 2.

RIB latch light comes on _____

RIBX "Loop Enabled" indicator goes out _____

RIBX "Loop Disabled" indicator comes on _____

Replace switch holder.

RIBX cannot be reset _____

Reset RIB

RIBX CAN be reset

("Loop Enabled" indicator comes on) _____

14. Remove holder from door switch 1.

RIA latch light comes on _____

RIAX "Loop Enabled" indicator goes out _____

RIAX "Loop Disabled" indicator comes on _____

The safety shutter closes _____

The photon shutter closes (if equipped) _____

RIAX cannot be reset _____

Reset RIA

RIAX CAN be reset

("Loop Enabled" indicator comes on) _____

15. Remove the holders from the switches. Remove the latch device from the door lock(s). Stand inside the hutch and open and close the door.

All door switches operate freely and each makes a "click" when door is opened

Door:	
1	2

16. Search the hutch. Locate the safety shutter associated with the beam line by tracing the beam pipe through the shield wall. Do not rely on labels on the shutter mechanism. Open the shutter.

The correct shutter opens _____

No other shutter at that saw tooth opens or attempts to open _____

Close the safety shutter.

The mechanism moves freely and without hesitation _____

17. Remove user interlock test jumper (if applicable). _____

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